

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Westfield

Westfield Executive Park

53 Southampton Road

Westfield, MA 01085

Tel: (413)572-4000

CHECKED FOR COMPLETENESS  
OF PARAMETERS ORDERED BY:

*Joe Chimi*

TestAmerica Job ID: 360-39434-1

Client Project/Site: Olin Chemical

For:

Olin Corporation

PO BOX 248

Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

*Joseph Chimi*

Authorized for release by:

3/21/2012 11:49:25 AM

Joe Chimi

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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## Case Narrative

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

### Job ID: 360-39434-1

#### Laboratory: TestAmerica Westfield

##### Narrative

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

##### Receipt

The samples were received on 03/07/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.6°C.

##### GC/MS VOA

Method 8260C: The following sample was diluted due to the abundance of target analytes: OC-GW 16R (360-39434-1). Elevated reporting limits (RLs) are provided.

At the request of the client, a non-MCP compound list was reported for this job.

No other analytical or quality issues were noted.

##### GC/MS Semi VOA

Method 8270D: The method blank for batch 88223 contained Bis(2-ethylhexyl) phthalate above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

The following sample was diluted due to the abundance of target analytes: OC-GW 16R (360-39434-1). Elevated reporting limits (RLs) are provided. Consequently, all surrogates were diluted outside control limits.

At the request of the client, an abbreviated MCP compound list was reported for this job.

No other analytical or quality issues were noted.

##### GC VOA

Method MAVPH: The calibration curve uses quadratic regressions for m-Xylene & p-Xylene and C9-C10 Aromatics.

The following sample was diluted due to foaming at the time of purging during the original sample analysis: OC-GW 16R (360-39434-1). Elevated reporting limits (RLs) are provided.

Samples (360-39434-1 MS), (360-39434-1 MSD) and OC-GW 16R (360-39434-1) had a pH<2.

No other analytical or quality issues were noted.

##### Metals

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No analytical or quality issues were noted.

##### Field Service / Mobile Lab

No analytical or quality issues were noted.

##### General Chemistry

No analytical or quality issues were noted.

## Case Narrative

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

### Job ID: 360-39434-1 (Continued)

#### Laboratory: TestAmerica Westfield (Continued)

##### Organic Prep

No analytical or quality issues were noted.

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# MassDEP Analytical Protocol Certification Form

Laboratory Name: <b>TestAmerica Westfield</b>		Project #: <b>360-39434-1</b>			
Project Location: <b>Olin Chemical Superfund Site</b>		RTN:			
<b>This form provides certifications for the following data set: list Laboratory Sample ID Number(s): 360-39434-(1-3)</b>					
Matrices: <input checked="" type="checkbox"/> Groundwater/Surface Water <input type="checkbox"/> Soil/Sediment <input type="checkbox"/> Drinking Water <input type="checkbox"/> Air <input type="checkbox"/> Other:					
<b>CAM Protocols (check all that apply below):</b>					
8260 VOC CAM II A <input checked="" type="checkbox"/>	7470/7471 Hg CAM III B <input type="checkbox"/>	Mass DEP VPH CAM IV A <input checked="" type="checkbox"/>	8081 Pesticides CAM V B <input type="checkbox"/>	7196 Hex Cr CAM VI B <input type="checkbox"/>	Mass DEP APH CAM IX A <input type="checkbox"/>
8270 SVOC CAM II B <input checked="" type="checkbox"/>	7010 Metals CAM III C <input type="checkbox"/>	Mass DEP EPH CAM IV B <input type="checkbox"/>	8151 Herbicides CAM V C <input type="checkbox"/>	8330 Explosives CAM VIII A <input type="checkbox"/>	TO-15 VOC CAM IX B <input type="checkbox"/>
6010 Metals CAM III A <input checked="" type="checkbox"/>	6020 Metals CAM III D <input type="checkbox"/>	8082 PCB CAM V A <input type="checkbox"/>	9014 Total Cyanide/PAC CAM VI A <input type="checkbox"/>	6860 Perchlorate CAM VIII B <input type="checkbox"/>	
<b>Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status</b>					
<b>A</b>	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>B</b>	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>C</b>	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>D</b>	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>E</b>	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>F</b>	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Responses to Questions G, H and I below are required for "Presumptive Certainty" status</b>					
<b>G</b>	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <sup>1</sup>	
<b>Data User Note:</b> Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350					
<b>H</b>	Were all QC performance standards specified in the CAM protocol(s) achieved?			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>	
<b>I</b>	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <sup>1</sup>	
<sup>1</sup> All negative responses must be addressed in an attached laboratory narrative.					
<b>I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.</b>					
Signature:			Position:	Laboratory Director	
Printed Name:	Steven C. Hartmann		Date:	3/21/12 11:40	
This form has been electronically signed and approved					

# Detection Summary

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

**Client Sample ID: OC-GW 16R**

**Lab Sample ID: 360-39434-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	1200		20	4.0	ug/L	20		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	360		20	4.0	ug/L	20		8260C	Total/NA
N-Nitrosodiphenylamine - DL	330		94	9.4	ug/L	20		8270D	Total/NA
Iron	1900		100	21	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
o-Xylene	8.4		4.0	4.0	ug/L	4		MAVPH	Total/NA
C5-C8 Aliphatics (unadjusted)	1500		200	200	ug/L	4		MAVPH	Total/NA
C5-C8 Aliphatics (adjusted)	1500		200	200	ug/L	4		MAVPH	Total/NA
Total VPH	1500		200	200	ug/L	4		MAVPH	Total/NA
Ammonia	0.25		0.10	0.10	mg/L	1		L107-06-1B	Total/NA
pH	6.87	HF	0.100	0.100	SU	1		SM 4500 H+ B	Total/NA

**Client Sample ID: OC-GW 79S**

**Lab Sample ID: 360-39434-2**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	16	J	100	13	ug/L	1		6010C	Dissolved
Chromium	5.6		5.0	0.66	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1200		40	40	mg/L	20		300.0	Total/NA
Chloride	180		10	10	mg/L	10		300.0	Total/NA
Ammonia	140		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	3000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

**Client Sample ID: OC-PZ 16RR**

**Lab Sample ID: 360-39434-3**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	5.3		5.0	0.66	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	740		20	20	mg/L	10		300.0	Total/NA
Chloride	130		10	10	mg/L	10		300.0	Total/NA
Ammonia	110		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	2100		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

**Client Sample ID: OC-Trip Blank**

**Lab Sample ID: 360-39434-4**

No Detections

## Method Summary

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	MA DEP	TAL WFD
8270D	Semivolatile Organic Compounds (GC/MS) Low Level	MA DEP	TAL WFD
MAVPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	TAL WFD
6010C	Metals (ICP)	SW846	TAL WFD
300.0	Chloride & Sulfate	40CFR136A	TAL WFD
L107-06-1B	Nitrogen Ammonia	LACHAT	TAL WFD
SM 2510B	Conductivity, Specific Conductance	SM	TAL WFD
SM 4500 H+ B	pH	SM	TAL WFD

### Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

MA DEP = Massachusetts Department Of Environmental Protection

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

## Sample Summary

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
360-39434-1	OC-GW 16R	Water	03/07/12 08:10	03/07/12 17:10
360-39434-2	OC-GW 79S	Water	03/07/12 10:00	03/07/12 17:10
360-39434-3	OC-PZ 16RR	Water	03/07/12 10:20	03/07/12 17:10
360-39434-4	OC-Trip Blank	Water	03/07/12 08:10	03/07/12 17:10

# Client Sample Results

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

## Client Sample ID: OC-GW 16R

Date Collected: 03/07/12 08:10

Date Received: 03/07/12 17:10

## Lab Sample ID: 360-39434-1

Matrix: Water

### Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	1200		20	4.0	ug/L			03/12/12 13:32	20
2,4,4-Trimethyl-2-pentene	360		20	4.0	ug/L			03/12/12 13:32	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	103		70 - 130					03/12/12 13:32	20
Toluene-d8 (Surr)	100		70 - 130					03/12/12 13:32	20
Dibromofluoromethane	101		70 - 130					03/12/12 13:32	20

### Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	0.47	ug/L		03/08/12 15:24	03/09/12 15:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorophenol	29		15 - 110				03/08/12 15:24	03/09/12 15:22	1
Phenol-d5	23		15 - 110				03/08/12 15:24	03/09/12 15:22	1
Nitrobenzene-d5	61		30 - 130				03/08/12 15:24	03/09/12 15:22	1
2,4,6-Tribromophenol	92		15 - 110				03/08/12 15:24	03/09/12 15:22	1
Terphenyl-d14	93		30 - 130				03/08/12 15:24	03/09/12 15:22	1
2-Fluorobiphenyl	61		30 - 130				03/08/12 15:24	03/09/12 15:22	1

### Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	330		94	9.4	ug/L		03/08/12 15:24	03/14/12 16:47	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorophenol	0	DX	15 - 110				03/08/12 15:24	03/14/12 16:47	20
Phenol-d5	0	DX	15 - 110				03/08/12 15:24	03/14/12 16:47	20
Nitrobenzene-d5	0	DX	30 - 130				03/08/12 15:24	03/14/12 16:47	20
2,4,6-Tribromophenol	0	DX	15 - 110				03/08/12 15:24	03/14/12 16:47	20
Terphenyl-d14	0	DX	30 - 130				03/08/12 15:24	03/14/12 16:47	20
2-Fluorobiphenyl	0	DX	30 - 130				03/08/12 15:24	03/14/12 16:47	20

### Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.0	4.0	ug/L			03/20/12 01:18	4
Ethylbenzene	ND		4.0	4.0	ug/L			03/20/12 01:18	4
m-Xylene & p-Xylene	ND		8.0	8.0	ug/L			03/20/12 01:18	4
Methyl tert-butyl ether	ND		4.0	4.0	ug/L			03/20/12 01:18	4
Naphthalene	ND		20	20	ug/L			03/20/12 01:18	4
<b>o-Xylene</b>	<b>8.4</b>		4.0	4.0	ug/L			03/20/12 01:18	4
Toluene	ND		4.0	4.0	ug/L			03/20/12 01:18	4
<b>C5-C8 Aliphatics (unadjusted)</b>	<b>1500</b>		200	200	ug/L			03/20/12 01:18	4
C9-C12 Aliphatics (unadjusted)	ND		200	200	ug/L			03/20/12 01:18	4
<b>C5-C8 Aliphatics (adjusted)</b>	<b>1500</b>		200	200	ug/L			03/20/12 01:18	4
C9-C12 Aliphatics (adjusted)	ND		200	200	ug/L			03/20/12 01:18	4
C9-C10 Aromatics	ND		200	200	ug/L			03/20/12 01:18	4
<b>Total VPH</b>	<b>1500</b>		200	200	ug/L			03/20/12 01:18	4
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	100		70 - 130					03/20/12 01:18	4
2,5-Dibromotoluene (pid)	110		70 - 130					03/20/12 01:18	4

# Client Sample Results

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

**Client Sample ID: OC-GW 16R**

**Lab Sample ID: 360-39434-1**

Date Collected: 03/07/12 08:10

Matrix: Water

Date Received: 03/07/12 17:10

## Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1900		100	21	ug/L			03/13/12 15:34	1

## General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.25		0.10	0.10	mg/L		03/16/12 10:29	03/20/12 15:54	1
pH	6.87	HF	0.100	0.100	SU			03/09/12 09:29	1

# Client Sample Results

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

**Client Sample ID: OC-GW 79S**

**Lab Sample ID: 360-39434-2**

**Matrix: Water**

Date Collected: 03/07/12 10:00

Date Received: 03/07/12 17:10

**Method: 6010C - Metals (ICP) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	16	J	100	13	ug/L			03/13/12 15:47	1
Chromium	5.6		5.0	0.66	ug/L			03/13/12 15:47	1

**General Chemistry**

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1200		40	40	mg/L			03/16/12 22:40	20
Chloride	180		10	10	mg/L			03/16/12 03:05	10
Ammonia	140		2.0	2.0	mg/L		03/16/12 10:29	03/20/12 16:35	20
Specific Conductance	3000		1.0	1.0	umhos/cm			03/16/12 14:29	1

# Client Sample Results

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

**Client Sample ID: OC-PZ 16RR**

**Lab Sample ID: 360-39434-3**

Date Collected: 03/07/12 10:20

Matrix: Water

Date Received: 03/07/12 17:10

## Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/13/12 15:50	1
Chromium	5.3		5.0	0.66	ug/L			03/13/12 15:50	1

## General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	740		20	20	mg/L			03/16/12 03:36	10
Chloride	130		10	10	mg/L			03/16/12 03:36	10
Ammonia	110		2.0	2.0	mg/L		03/16/12 10:29	03/20/12 16:36	20
Specific Conductance	2100		1.0	1.0	umhos/cm			03/16/12 14:30	1

# Client Sample Results

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

**Client Sample ID: OC-Trip Blank**

**Lab Sample ID: 360-39434-4**

**Matrix: Water**

Date Collected: 03/07/12 08:10

Date Received: 03/07/12 17:10

## Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.20	ug/L			03/12/12 13:53	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.20	ug/L			03/12/12 13:53	1
<hr/>									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	101		70 - 130					03/12/12 13:53	1
Toluene-d8 (Surrogate)	102		70 - 130					03/12/12 13:53	1
Dibromofluoromethane	103		70 - 130					03/12/12 13:53	1

## Definitions/Glossary

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

### Qualifiers

#### GC/MS Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes

### Glossary

#### Abbreviation

These commonly used abbreviations may or may not be present in this report.

dw	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Association Summary

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

## GC/MS VOA

### Analysis Batch: 88289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	8260C	
360-39434-4	OC-Trip Blank	Total/NA	Water	8260C	
LCS 360-88289/3	Lab Control Sample	Total/NA	Water	8260C	
LCSD 360-88289/4	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 360-88289/6	Method Blank	Total/NA	Water	8260C	

## GC/MS Semi VOA

### Prep Batch: 88223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	3510C	
360-39434-1 - DL	OC-GW 16R	Total/NA	Water	3510C	
LCS 360-88223/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 360-88223/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 360-88223/1-A	Method Blank	Total/NA	Water	3510C	

### Analysis Batch: 88264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	8270D	
LCS 360-88223/2-A	Lab Control Sample	Total/NA	Water	8270D	
LCSD 360-88223/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	
MB 360-88223/1-A	Method Blank	Total/NA	Water	8270D	

### Analysis Batch: 88375

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1 - DL	OC-GW 16R	Total/NA	Water	8270D	88223

## GC VOA

### Analysis Batch: 88571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	MAVPH	
360-39434-1 MS	OC-GW 16R	Total/NA	Water	MAVPH	
360-39434-1 MSD	OC-GW 16R	Total/NA	Water	MAVPH	
LCS 360-88571/3	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 360-88571/4	Lab Control Sample Dup	Total/NA	Water	MAVPH	
MB 360-88571/6	Method Blank	Total/NA	Water	MAVPH	

## Metals

### Analysis Batch: 88389

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Dissolved	Water	6010C	
360-39434-1 DU	OC-GW 16R	Dissolved	Water	6010C	
360-39434-1 MS	OC-GW 16R	Dissolved	Water	6010C	
360-39434-2	OC-GW 79S	Dissolved	Water	6010C	
360-39434-3	OC-PZ 16RR	Dissolved	Water	6010C	
LCS 360-88389/1	Lab Control Sample	Total/NA	Water	6010C	
LCSD 360-88389/10	Lab Control Sample Dup	Total/NA	Water	6010C	
MB 360-88389/2	Method Blank	Total/NA	Water	6010C	

# QC Association Summary

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

## General Chemistry

### Analysis Batch: 88258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	SM 4500 H+ B	
LCS 360-88258/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

### Prep Batch: 88493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	Distill/Amonnia	
360-39434-2	OC-GW 79S	Total/NA	Water	Distill/Amonnia	
360-39434-3	OC-PZ 16RR	Total/NA	Water	Distill/Amonnia	
LCS 360-88493/2-A	Lab Control Sample	Total/NA	Water	Distill/Amonnia	
MB 360-88493/1-A	Method Blank	Total/NA	Water	Distill/Amonnia	

### Analysis Batch: 88521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-2	OC-GW 79S	Total/NA	Water	SM 2510B	
360-39434-3	OC-PZ 16RR	Total/NA	Water	SM 2510B	
LCS 360-88521/1	Lab Control Sample	Total/NA	Water	SM 2510B	
MB 360-88521/3	Method Blank	Total/NA	Water	SM 2510B	

### Analysis Batch: 88534

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-2	OC-GW 79S	Total/NA	Water	300.0	
360-39434-3	OC-PZ 16RR	Total/NA	Water	300.0	
LCS 360-88534/6	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88534/5	Method Blank	Total/NA	Water	300.0	

### Analysis Batch: 88537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-2	OC-GW 79S	Total/NA	Water	300.0	
LCS 360-88537/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88537/3	Method Blank	Total/NA	Water	300.0	

### Analysis Batch: 88618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	L107-06-1B	88493
360-39434-2	OC-GW 79S	Total/NA	Water	L107-06-1B	88493
360-39434-3	OC-PZ 16RR	Total/NA	Water	L107-06-1B	88493
LCS 360-88493/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	88493
MB 360-88493/1-A	Method Blank	Total/NA	Water	L107-06-1B	88493

## Surrogate Summary

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

### Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		BFB (70-130)	TOL (70-130)	DBFM (70-130)
360-39434-1	OC-GW 16R	103	100	101
360-39434-4	OC-Trip Blank	101	102	103
LCS 360-88289/3	Lab Control Sample	102	104	105
LCSD 360-88289/4	Lab Control Sample Dup	102	104	103
MB 360-88289/6	Method Blank	103	100	103

#### Surrogate Legend

BFB = 4-Bromofluorobenzene

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane

### Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		2FP (15-110)	PHL (15-110)	NBZ (30-130)	TBP (15-110)	TPH (30-130)	FBP (30-130)
360-39434-1	OC-GW 16R	29	23	61	92	93	61
360-39434-1 - DL	OC-GW 16R	0 D X	0 D X	0 D X	0 D X	0 D X	0 D X
LCS 360-88223/2-A	Lab Control Sample	52	35	94	94	99	83
LCSD 360-88223/3-A	Lab Control Sample Dup	51	34	94	99	109	83
MB 360-88223/1-A	Method Blank	56	35	97	93	102	84

#### Surrogate Legend

2FP = 2-Fluorophenol

PHL = Phenol-d5

NBZ = Nitrobenzene-d5

TBP = 2,4,6-Tribromophenol

TPH = Terphenyl-d14

FBP = 2-Fluorobiphenyl

### Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		25DBT2 (70-130)	25DBT1 (70-130)
360-39434-1	OC-GW 16R	100	110
360-39434-1 MS	OC-GW 16R	99	82
360-39434-1 MSD	OC-GW 16R	99	79
LCS 360-88571/3	Lab Control Sample	100	82
LCSD 360-88571/4	Lab Control Sample Dup	101	83
MB 360-88571/6	Method Blank	98	110

#### Surrogate Legend

25DBT = 2,5-Dibromotoluene (fid)

## QC Sample Results

Client: Olin Corporation  
 Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

### Method: 8260C - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 360-88289/6**

**Matrix: Water**

**Analysis Batch: 88289**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB MB		D	Prepared	Analyzed	Dil Fac
	Result	Qualifier				
2,4,4-Trimethyl-1-pentene	ND		1.0	0.20	ug/L	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.20	ug/L	1

  

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
4-Bromofluorobenzene	103		70 - 130		03/12/12 10:59	1
Toluene-d8 (Surr)	100		70 - 130		03/12/12 10:59	1
Dibromofluoromethane	103		70 - 130		03/12/12 10:59	1

**Lab Sample ID: LCS 360-88289/3**

**Matrix: Water**

**Analysis Batch: 88289**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike		Unit	D	%Rec	Limits
	Added	Result				
2,4,4-Trimethyl-1-pentene	20.0	23.0	ug/L	115	70 - 130	
2,4,4-Trimethyl-2-pentene	20.0	22.9	ug/L	115	70 - 130	

  

Surrogate	LCS LCS		Unit	D	%Rec	Limits
	%Recovery	Qualifier				
4-Bromofluorobenzene	102		70 - 130			
Toluene-d8 (Surr)	104		70 - 130			
Dibromofluoromethane	105		70 - 130			

**Lab Sample ID: LCSD 360-88289/4**

**Matrix: Water**

**Analysis Batch: 88289**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike		Unit	D	%Rec	Limits	RPD	Limit
	Added	Result						
2,4,4-Trimethyl-1-pentene	20.0	22.1	ug/L	111	70 - 130		4	20
2,4,4-Trimethyl-2-pentene	20.0	22.6	ug/L	113	70 - 130		1	20

  

Surrogate	LCSD LCSD		Unit	D	%Rec	Limits	RPD	Limit
	%Recovery	Qualifier						
4-Bromofluorobenzene	102		70 - 130					
Toluene-d8 (Surr)	104		70 - 130					
Dibromofluoromethane	103		70 - 130					

### Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

**Lab Sample ID: MB 360-88223/1-A**

**Matrix: Water**

**Analysis Batch: 88264**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB MB		D	Prepared	Analyzed	Dil Fac
	Result	Qualifier				
Bis(2-ethylhexyl) phthalate	1.11	J	2.0	0.50	ug/L	1
N-Nitrosodiphenylamine	ND		5.0	0.50	ug/L	1

  

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2-Fluorophenol	56		15 - 110	03/08/12 15:24	03/09/12 19:32	1
Phenol-d5	35		15 - 110	03/08/12 15:24	03/09/12 19:32	1
Nitrobenzene-d5	97		30 - 130	03/08/12 15:24	03/09/12 19:32	1

# QC Sample Results

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

## Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level (Continued)

Lab Sample ID: MB 360-88223/1-A

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 88264

Prep Batch: 88223

Surrogate	MB		%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
	MB	MB						
2,4,6-Tribromophenol		93			15 - 110	03/08/12 15:24	03/09/12 19:32	1
Terphenyl-d14		102			30 - 130	03/08/12 15:24	03/09/12 19:32	1
2-Fluorobiphenyl		84			30 - 130	03/08/12 15:24	03/09/12 19:32	1

Lab Sample ID: LCS 360-88223/2-A

Client Sample ID: Lab Control Sample

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 88264

Prep Batch: 88223

Analyte	MB		Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
	LCS	MB								
Bis(2-ethylhexyl) phthalate			8.00	8.25		ug/L		103	40 - 140	
N-Nitrosodiphenylamine			8.00	7.71		ug/L		96	40 - 140	

Surrogate	LCS		%Recovery	Qualifier	Limits
	LCS	MB			
2-Fluorophenol		52			15 - 110
Phenol-d5		35			15 - 110
Nitrobenzene-d5		94			30 - 130
2,4,6-Tribromophenol		94			15 - 110
Terphenyl-d14		99			30 - 130
2-Fluorobiphenyl		83			30 - 130

Lab Sample ID: LCSD 360-88223/3-A

Client Sample ID: Lab Control Sample Dup

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 88264

Prep Batch: 88223

Analyte	LCS		Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec.	RPD
	LCS	MB								
Bis(2-ethylhexyl) phthalate			8.00	8.99		ug/L		112	40 - 140	9
N-Nitrosodiphenylamine			8.00	7.66		ug/L		96	40 - 140	1

Surrogate	LCSD		%Recovery	Qualifier	Limits
	LCSD	MB			
2-Fluorophenol		51			15 - 110
Phenol-d5		34			15 - 110
Nitrobenzene-d5		94			30 - 130
2,4,6-Tribromophenol		99			15 - 110
Terphenyl-d14		109			30 - 130
2-Fluorobiphenyl		83			30 - 130

## Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 360-88571/6

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 88571

Analyte	MB		Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
	MB	MB									
Benzene			ND		1.0	1.0	ug/L		03/20/12 00:12		1
Ethylbenzene			ND		1.0	1.0	ug/L		03/20/12 00:12		1
m-Xylene & p-Xylene			ND		2.0	2.0	ug/L		03/20/12 00:12		1
Methyl tert-butyl ether			ND		1.0	1.0	ug/L		03/20/12 00:12		1
Naphthalene			ND		5.0	5.0	ug/L		03/20/12 00:12		1
o-Xylene			ND		1.0	1.0	ug/L		03/20/12 00:12		1

**QC Sample Results**

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

**Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)**

Lab Sample ID: MB 360-88571/6

 Client Sample ID: Method Blank  
 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88571

Analyte	MB	MB	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND				1.0	1.0	ug/L			03/20/12 00:12	1
C5-C8 Aliphatics (unadjusted)	ND				50	50	ug/L			03/20/12 00:12	1
C9-C12 Aliphatics (unadjusted)	ND				50	50	ug/L			03/20/12 00:12	1
C5-C8 Aliphatics (adjusted)	ND				50	50	ug/L			03/20/12 00:12	1
C9-C12 Aliphatics (adjusted)	ND				50	50	ug/L			03/20/12 00:12	1
C9-C10 Aromatics	ND				50	50	ug/L			03/20/12 00:12	1
Total VPH	ND				50	50	ug/L			03/20/12 00:12	1

  

Surrogate	MB	MB	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)		98			70 - 130				03/20/12 00:12	1
2,5-Dibromotoluene (pid)		110			70 - 130				03/20/12 00:12	1

Lab Sample ID: LCS 360-88571/3

 Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88571

Analyte	Spike Added	LCS	LCS	D	%Rec	Limits	%Rec.
		Result	Qualifier				
Benzene	100	113		ug/L	113	70 - 130	
Ethylbenzene	100	114		ug/L	114	70 - 130	
m-Xylene & p-Xylene	200	194		ug/L	97	70 - 130	
Methyl tert-butyl ether	100	105		ug/L	105	70 - 130	
Naphthalene	100	114		ug/L	114	70 - 130	
o-Xylene	100	109		ug/L	109	70 - 130	
Toluene	100	110		ug/L	110	70 - 130	
C5-C8 Aliphatics (unadjusted)	300	315		ug/L	105	70 - 130	
C9-C12 Aliphatics (unadjusted)	300	266		ug/L	89	70 - 130	
C9-C10 Aromatics	100	101		ug/L	101	70 - 130	
Butylcyclohexane	100	87.5		ug/L	88	70 - 130	
1,2,4-Trimethylbenzene	100	110		ug/L	110	70 - 130	
2-Methylpentane	100	106		ug/L	106	70 - 130	
Pentane	100	108		ug/L	108	70 - 130	
n-Nonane	100	86.2		ug/L	86	30 - 130	
n-Decane	100	87.7		ug/L	88	70 - 130	
Isooctane	100	101		ug/L	101	70 - 130	

  

Surrogate	LCS	LCS	%Recovery	Qualifier	Limits		%Rec.
2,5-Dibromotoluene (fid)	100		100		70 - 130		
2,5-Dibromotoluene (pid)	82		82		70 - 130		

Lab Sample ID: LCSD 360-88571/4

 Client Sample ID: Lab Control Sample Dup  
 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88571

Analyte	Spike	LCSD	LCSD	D	%Rec	Limits	RPD	RPD Limit
	Added		Result					
Benzene	100	110		ug/L	110	70 - 130	3	25
Ethylbenzene	100	112		ug/L	112	70 - 130	2	25
m-Xylene & p-Xylene	200	189		ug/L	94	70 - 130	3	25
Methyl tert-butyl ether	100	104		ug/L	104	70 - 130	1	25
Naphthalene	100	114		ug/L	114	70 - 130	0	25

# QC Sample Results

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

## **Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)**

**Lab Sample ID: LCSD 360-88571/4**

**Matrix: Water**

**Analysis Batch: 88571**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**

<b>Analyte</b>	<b>Spike Added</b>	<b>LCSD</b>		<b>Unit</b>	<b>D</b>	<b>%Rec.</b>	<b>RPD</b>	<b>RPD</b>
		<b>Result</b>	<b>Qualifier</b>					
o-Xylene	100	107		ug/L	107	70 - 130	2	25
Toluene	100	108		ug/L	108	70 - 130	3	25
C5-C8 Aliphatics (unadjusted)	300	306		ug/L	102	70 - 130	3	25
C9-C12 Aliphatics (unadjusted)	300	277		ug/L	92	70 - 130	4	25
C9-C10 Aromatics	100	99.0		ug/L	99	70 - 130	2	25
Butylcyclohexane	100	90.2		ug/L	90	70 - 130	3	25
1,2,4-Trimethylbenzene	100	107		ug/L	107	70 - 130	2	25
2-Methylpentane	100	102		ug/L	102	70 - 130	3	25
Pentane	100	104		ug/L	104	70 - 130	4	25
n-Nonane	100	88.8		ug/L	89	30 - 130	3	25
n-Decane	100	94.4		ug/L	94	70 - 130	7	25
Isooctane	100	97.9		ug/L	98	70 - 130	3	25
<hr/>								
<b>Surrogate</b>		<b>LCSD</b>	<b>LCSD</b>					
		<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				
2,5-Dibromotoluene (fid)	101			70 - 130				
2,5-Dibromotoluene (pid)	83			70 - 130				

**Lab Sample ID: 360-39434-1 MS**

**Matrix: Water**

**Analysis Batch: 88571**

**Client Sample ID: OC-GW 16R**  
**Prep Type: Total/NA**

<b>Analyte</b>	<b>Sample Result</b>	<b>Sample Qualifier</b>	<b>Spike Added</b>	<b>MS</b>		<b>Unit</b>	<b>D</b>	<b>%Rec.</b>	<b>Limits</b>	
				<b>Result</b>	<b>Qualifier</b>					
Benzene	ND		400	459		ug/L	115	70 - 130		
Ethylbenzene	ND		400	467		ug/L	117	70 - 130		
m-Xylene & p-Xylene	ND		800	769		ug/L	96	70 - 130		
Methyl tert-butyl ether	ND		400	411		ug/L	103	70 - 130		
Naphthalene	ND		400	447		ug/L	112	70 - 130		
o-Xylene	8.4		400	444		ug/L	109	70 - 130		
Toluene	ND		400	443		ug/L	111	70 - 130		
C5-C8 Aliphatics (unadjusted)	1500		1200	2920		ug/L	118	70 - 130		
C9-C12 Aliphatics (unadjusted)	ND		1200	1220		ug/L	102	70 - 130		
C9-C10 Aromatics	ND		400	462		ug/L	115	70 - 130		
Butylcyclohexane	ND		400	393		ug/L	98	70 - 130		
1,2,4-Trimethylbenzene	ND		400	443		ug/L	111	70 - 130		
2-Methylpentane	ND		400	424		ug/L	106	70 - 130		
Pentane	ND		400	432		ug/L	108	70 - 130		
n-Nonane	ND		400	392		ug/L	98	30 - 130		
n-Decane	ND		400	408		ug/L	102	70 - 130		
Isooctane	ND		400	416		ug/L	104	70 - 130		
<hr/>										
<b>Surrogate</b>		<b>MS</b>	<b>MS</b>							
		<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>						
2,5-Dibromotoluene (fid)	99			70 - 130						
2,5-Dibromotoluene (pid)	82			70 - 130						

# QC Sample Results

Client: Olin Corporation  
 Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

## Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

**Lab Sample ID:** 360-39434-1 MSD

**Client Sample ID:** OC-GW 16R

**Prep Type:** Total/NA

**Matrix:** Water

**Analysis Batch:** 88571

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec.	%Rec.	RPD	RPD Limit
	Result	Qualifier	Added	Result	Qualifier				Limits		
Benzene	ND		400	452		ug/L		113	70 - 130	1	50
Ethylbenzene	ND		400	452		ug/L		113	70 - 130	3	50
m-Xylene & p-Xylene	ND		800	765		ug/L		96	70 - 130	1	50
Methyl tert-butyl ether	ND		400	400		ug/L		100	70 - 130	3	50
Naphthalene	ND		400	447		ug/L		112	70 - 130	0	50
o-Xylene	8.4		400	439		ug/L		108	70 - 130	1	50
Toluene	ND		400	438		ug/L		110	70 - 130	1	50
C5-C8 Aliphatics (unadjusted)	1500		1200	2990		ug/L		125	70 - 130	3	50
C9-C12 Aliphatics (unadjusted)	ND		1200	1230		ug/L		103	70 - 130	1	50
C9-C10 Aromatics	ND		400	451		ug/L		113	70 - 130	2	50
Butylcyclohexane	ND		400	395		ug/L		99	70 - 130	0	50
1,2,4-Trimethylbenzene	ND		400	438		ug/L		110	70 - 130	1	50
2-Methylpentane	ND		400	432		ug/L		108	70 - 130	2	50
Pentane	ND		400	440		ug/L		110	70 - 130	2	50
n-Nonane	ND		400	396		ug/L		99	30 - 130	1	50
n-Decane	ND		400	413		ug/L		103	70 - 130	1	50
Isooctane	ND		400	422		ug/L		105	70 - 130	1	50
<i>Surrogate</i>		<i>MSD</i>	<i>MSD</i>								
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>							
2,5-Dibromotoluene ( <i>fid</i> )		99		70 - 130							
2,5-Dibromotoluene ( <i>pid</i> )		79		70 - 130							

## Method: 6010C - Metals (ICP)

**Lab Sample ID:** MB 360-88389/2

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

**Matrix:** Water

**Analysis Batch:** 88389

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed		Dil Fac
	Result	Qualifier						%Recovery	Qualifier	
Aluminum	ND		100	13	ug/L			03/13/12 15:31		1
Iron	ND		100	21	ug/L			03/13/12 15:31		1
Chromium	ND		5.0	0.66	ug/L			03/13/12 15:31		1

**Lab Sample ID:** LCS 360-88389/1

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

**Matrix:** Water

**Analysis Batch:** 88389

Analyte	Spike	LCS	LCS	%Rec.		
	Added	Result	Qualifier	Unit	D	
Aluminum	5000	5070		ug/L		101
Iron	5000	5040		ug/L		101
Chromium	1000	989		ug/L		99

**Lab Sample ID:** LCSD 360-88389/10

**Client Sample ID:** Lab Control Sample Dup

**Prep Type:** Total/NA

**Matrix:** Water

**Analysis Batch:** 88389

Analyte	Spike	LCSD	LCSD	%Rec.		
	Added	Result	Qualifier	Unit	D	
Aluminum	5000	5120		ug/L		102
Iron	5000	5100		ug/L		102

## QC Sample Results

Client: Olin Corporation  
 Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

### Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCSD 360-88389/10**

**Matrix: Water**

**Analysis Batch: 88389**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike	LCSD	LCSD	%Rec.			RPD	Limit
	Added	Result	Qualifier	Unit	D	%Rec		
Chromium	1000	998		ug/L		100	80 - 120	1 20

**Lab Sample ID: 360-39434-1 MS**

**Matrix: Water**

**Analysis Batch: 88389**

**Client Sample ID: OC-GW 16R**

**Prep Type: Dissolved**

Analyte	Sample	Sample	Spike	MS	MS	%Rec.			RPD	Limit
	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec		
Aluminum	ND		5000	5430		ug/L		109	75 - 125	
Iron	1900		5000	7190		ug/L		106	75 - 125	
Chromium	ND		1000	1040		ug/L		104	75 - 125	

**Lab Sample ID: 360-39434-1 DU**

**Matrix: Water**

**Analysis Batch: 88389**

**Client Sample ID: OC-GW 16R**

**Prep Type: Dissolved**

Analyte	Sample	Sample	Spike	DU	DU	%Rec.			RPD	Limit
	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec		
Aluminum	ND			ND		ug/L			NC	20
Iron	1900			1910		ug/L			0.4	20
Chromium	ND			ND		ug/L			NC	20

### Method: 300.0 - Chloride & Sulfate

**Lab Sample ID: MB 360-88534/5**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Analysis Batch: 88534**

Analyte	MB	MB	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Sulfate	ND		2.0	2.0	mg/L			03/15/12 22:48	1
Chloride	ND		1.0	1.0	mg/L			03/15/12 22:48	1

**Lab Sample ID: LCS 360-88534/6**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Analysis Batch: 88534**

Analyte	Spike	LCSC	LCSC	%Rec.			RPD	Limit
	Added	Result	Qualifier	Unit	D	%Rec		
Sulfate	80.0	83.3		mg/L		104	85 - 115	
Chloride	40.0	41.3		mg/L		103	85 - 115	

**Lab Sample ID: MB 360-88537/3**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Analysis Batch: 88537**

Analyte	MB	MB	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Sulfate	ND		2.0	2.0	mg/L			03/16/12 16:41	1
Chloride	ND		1.0	1.0	mg/L			03/16/12 16:41	1

# QC Sample Results

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

## Method: 300.0 - Chloride & Sulfate (Continued)

Lab Sample ID: LCS 360-88537/4

Matrix: Water

Analysis Batch: 88537

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
Sulfate	80.0	82.5		mg/L		103		85 - 115
Chloride	40.0	40.8		mg/L		102		85 - 115

## Method: L107-06-1B - Nitrogen Ammonia

Lab Sample ID: MB 360-88493/1-A

Matrix: Water

Analysis Batch: 88618

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 88493

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.10	0.10	mg/L		03/16/12 10:29	03/20/12 15:47	1

Lab Sample ID: LCS 360-88493/2-A

Matrix: Water

Analysis Batch: 88618

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 88493

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
Ammonia	10.0	8.99		mg/L		90		90 - 110

## Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 360-88521/3

Matrix: Water

Analysis Batch: 88521

Client Sample ID: Method Blank  
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			03/16/12 14:24	1

Lab Sample ID: LCS 360-88521/1

Matrix: Water

Analysis Batch: 88521

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
Specific Conductance	1410	1400		umhos/cm		99		85 - 115

## Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 360-88258/1

Matrix: Water

Analysis Batch: 88258

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
pH	6.00	5.950		SU		99		90 - 110

1  
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15

## DILUTION LOGS











## TestAmerica Westfield

## Analytical Dilution Preparation Log

Date:

3-19-12

Analyst Initials	Date	Method	LIMS Sample ID	Rptd Dil.	Sample Aliquot 1	Final Volume 1	Units	Sample Aliquot 2	Final Volume 2	Units	Serial Dilution		Comments
											Units	Units	
Cmk	3-19-12	MAVPH	394134-11	v1x	10.5	10.5	mL	50	mL				Foam
			394697-1	10X	5								odor
			-D9	25X	2								Foam
			-D3	10X	5								odor
			-D4	25X	2								Foam
			-D5	10X	5								Foam
			D6	10X	5								Foam
			D7	10X	5								Foam
			D8	10X	5								Foam
			D9	10X	5								Foam
			D11	10X	5								Odor
			D12	10X	5								
			D13	25X	2								
			D14	10X	5								
			D15	10X	5								
			D16	10X	5								ms/msD
Cmk	3-20-12	MAVPH	39434-1										

entries completed by day [ new page each day]

CMK 3-20-12

## Lab Chronicle

Client: Olin Corporation  
 Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

**Client Sample ID: OC-GW 16R**

**Lab Sample ID: 360-39434-1**

**Date Collected: 03/07/12 08:10**

**Matrix: Water**

**Date Received: 03/07/12 17:10**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20	88289	03/12/12 13:32	TH	TAL WFD
Total/NA	Prep	3510C			88223	03/08/12 15:24	TLV	TAL WFD
Total/NA	Analysis	8270D		1	88264	03/09/12 15:22	JLG	TAL WFD
Total/NA	Prep	3510C	DL		88223	03/08/12 15:24	TLV	TAL WFD
Total/NA	Analysis	8270D	DL	20	88375	03/14/12 16:47	JLG	TAL WFD
Total/NA	Analysis	MAVPH		4	88571	03/20/12 01:18	CMR	TAL WFD
Dissolved	Analysis	6010C		1	88389	03/13/12 15:34	TJS	TAL WFD
Total/NA	Analysis	SM 4500 H+ B		1	88258	03/09/12 09:29	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88493	03/16/12 10:29	AMS	TAL WFD
Total/NA	Analysis	L107-06-1B		1	88618	03/20/12 15:54	RWE	TAL WFD

**Client Sample ID: OC-GW 79S**

**Lab Sample ID: 360-39434-2**

**Date Collected: 03/07/12 10:00**

**Matrix: Water**

**Date Received: 03/07/12 17:10**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88389	03/13/12 15:47	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:29	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 03:05	AMS	TAL WFD
Total/NA	Analysis	300.0		20	88537	03/16/12 22:40	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88493	03/16/12 10:29	AMS	TAL WFD
Total/NA	Analysis	L107-06-1B		20	88618	03/20/12 16:35	RWE	TAL WFD

**Client Sample ID: OC-PZ 16RR**

**Lab Sample ID: 360-39434-3**

**Date Collected: 03/07/12 10:20**

**Matrix: Water**

**Date Received: 03/07/12 17:10**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88389	03/13/12 15:50	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:30	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 03:36	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88493	03/16/12 10:29	AMS	TAL WFD
Total/NA	Analysis	L107-06-1B		20	88618	03/20/12 16:36	RWE	TAL WFD

**Client Sample ID: OC-Trip Blank**

**Lab Sample ID: 360-39434-4**

**Date Collected: 03/07/12 08:10**

**Matrix: Water**

**Date Received: 03/07/12 17:10**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	88289	03/12/12 13:53	TH	TAL WFD

### Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

## Certification Summary

Client: Olin Corporation  
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Westfield	Connecticut	State Program	1	PH-0494
TestAmerica Westfield	Maine	State Program	1	MA00014
TestAmerica Westfield	Massachusetts	State Program	1	M-MA014
TestAmerica Westfield	New Hampshire	NELAC	1	2539
TestAmerica Westfield	New York	NELAC	2	10843
TestAmerica Westfield	Rhode Island	State Program	1	LAO00057
TestAmerica Westfield	Vermont	State Program	1	VT-10843

Accreditation may not be offered or required for all methods and analytes reported in this package . Please contact your project manager for the laboratory's current list of certified methods and analytes.

# State Accreditation Matrix

Method Name	Description	Primary Accreditation	
		New Hampshire (NELAC)	Mass
180.1	Turbidity, Nephelometric	P	P
245.1	Mercury (CVAA)	NP/P	NP
300	Anions, Ion Chromatography	NP/P	NP/P
410.4	COD	NP	NP
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P
524.2	Trihalomethane compounds	P	P
608	Organochlorine Pest/PCBs (list upon request)	NP	NP
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP	NP
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW	
1103.1	E.coli		ambient/source
3546	Microwave Extraction	SW	
5035	Closed System Purge and Trap	SW	
6020	Metals (ICP/MS) (list upon request)	NP	
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P	
3010A	Preparation, Total Metals	NP/P	
3020A	Preparation, Total Metals	NP/P	
3050B	Preparation, Metals	SW	
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP	
5030B	Purge and Trap	NP	
6010C	Metals (ICP)(list upon request)	NP/SW	
7196A	Chromium, Hexavalent	NP/SW	
7470A	Mercury (CVAA)	NP	
7471A	Mercury (CVAA)	SW	
8081B	Organochlorine Pesticides (GC)(list upon request)	NP/SW	
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW	
8260C	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW	
8270D	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW	
9012A	Cyanide, Total and/or Amenable	NP/SW	
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP	
9045C	pH	SW	
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)	NP/SW	
Enterolert	Enterococcus		ambient/source
L107041C	Nitrogen, Nitrate	NP	
L107-06-1B	Nitrogen Ammonia	NP	NP
L204001A CN	Cyanide, Total	P	NP/P
L210-001A	Phenolics, Total Recoverable	NP	NP
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	NP/SW	
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)	NP/SW	
SM 2320B	Alkalinity	NP/P	NP/P
SM 2340B	Total Hardness (as CaCO <sub>3</sub> ) by calculation	NP/P	NP
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P
SM 2540D	Solids, Total Suspended (TSS)	NP	NP
SM 3500 CR D	Chromium, Hexavalent	NP	
SM 4500 CI F	Chlorine, Residual		NP
SM 4500 H+ B	pH	NP/P	NP/P
SM 4500 NO <sub>2</sub> B	Nitrogen, Nitrite	NP	P
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP
SM 4500 P E	Phosphorus, Total	NP	NP
SM 4500 S2 D	Sulfide, Total	NP	
SM 5210B	BOD, 5-Day	NP	NP
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP
SM 9215E	Heterotrophic Plate Count (SimPlate)		P
SM 9222D	Coliforms, Fecal (Membrane Filter)		NP
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P
SM 9223	Coliforms, Total, and E.Coli (Enumeration)		P

Not all organic compounds are accredited under YNI

For methods with multiple compounds all compounds may not meet TNI criteria, a listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is the laboratories typical listing but is subject to change based on the laboratories current certification standing.

## Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 360-39434-1

**Login Number:** 39434

**List Source:** TestAmerica Westfield

**List Number:** 1

**Creator:** Ard, Vanessa L

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**TestAmerica Westfield**

Westfield Executive Park 53 Southampton Road  
Westfield, MA 01085  
Phone (413) 572-4000 Fax (413) 572-3707

**Chain of Custody Record**

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING

<b>Client Information</b>		Sampler: <b>BRIAN GUILCHARD</b>	Lab P/M: Mason, Becky C	Carrier Tracking No(s): COC No: 360-10702-2
Client Contact: Mr. Brian Guichard		Phone: 51 Eames street	E-Mail: becky.mason@testamericainc.com	Page: 2 of 2
Company: Olin Corporation		Address: Cty: Willington	TAT Requested (days):	Job #:
		State, Zip: MA, 01887	PO #: REW10013	
		Phone: Email: beguichard@olin.com	WO #: Project #: 3600-816	
		Project Name: Olin Chemical Superfund Site	SSOW#:	
<b>Analysis Requested</b>				
<input checked="" type="checkbox"/> Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> Perform MSD/MSDS (Yes or No)				
Sample Date      Sample Time      Sample Type (C=comp, G=grab)      Matrix (Water, Solid, Oil/waste, Ash) Preservation Code: X				
S    D    N    I    A				
3-7-12    8:10    C    Water    2    2    2    6    4 <b>✓</b> 3-7-12    10:00    G    w    1    1    1 <b>✓</b> 3-7-12    10:30    G    w    1    1    1 <b>✓</b> <b>✓</b> 3-16-12				
<b>Sample Identification</b>				
6W 16R 6W 79S 6- 3-16-12				
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)				
Empty Kit Relinquished By: <b>Doug</b> Date: <b>3-7-12</b> Received By: <b>Jerry Dahl</b> Time: <b>6:33:30</b> Method of Shipment: Company Relinquished By: <b>Doug</b> Date: <b>3-7-12</b> Received By: <b>Jerry Dahl</b> Time: <b>6:33:30</b> Method of Shipment: Company Relinquished By: <b>Doug</b> Date: <b>3-7-12</b> Received By: <b>Jerry Dahl</b> Time: <b>6:33:30</b> Method of Shipment: Company				
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months				
Special Instructions/QC Requirements: Cooler Temperature(s) °C and Other Remarks: △ Yes    ▲ No				
Custody Seal Intact: <input checked="" type="checkbox"/> Custody Seal No.: <b>110</b>				